New GS1 application standard for visibility in rail

Provides roadmap for rail stakeholders to gain visibility of rolling stock and access to real-time information

We are delighted to announce the publication of the new GS1 application standard, EPCIS for Rail Vehicle Visibility. The application standard has been created by a team of rail stakeholders, solution providers and GS1 Member Organisations. This represents a significant achievement in collaboration and consensus on the use of GS1 standards in the rail sector.

The new standard allows rail stakeholders to leverage EPCIS to obtain complete visibility of rolling stock in real-time. This capability provides significant business benefits for all players, including:

- **Improved safety**
- **Facilitation of preventative maintenance**
- **Reduced environmental impact of transport**
- **Improved customer service**
- **Greater process efficiencies**
- **Reduced costs**

The standard addresses some of the most pressing challenges for rail companies and operators today. Due to limited visibility and information about rail vehicles, it's difficult for rail operators to plan and meet customer demands for timely deliveries and updates. They must also rely on manual, time-consuming processes to track and manage vehicle maintenance activities, often reacting to problems instead of proactively preventing them. For rail companies, the lack of preventative maintenance negatively impacts operational safety and efficiency.

Governments are also adding pressure with mandates and legislation. In the next 35 years, the European Union (EU) seeks to shift 50 percent of road freight—as well as a majority of passenger traffic travelling to medium-distance destinations—to rail and waterways. These ambitious goals are aimed at reducing the sector's carbon footprint and creating a unified transportation network.

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Karl Åkerlund
Rail Infrastructure Manager, Trafikverket
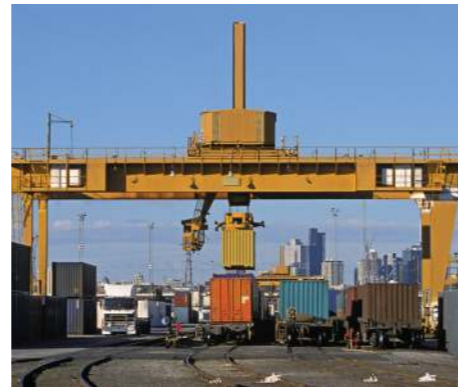
"Standards are being supported by an increasing number of train operators in Great Britain and across Europe, meaning the same tags can be used on either side of the Channel Tunnel, no matter what system is actually doing the reading, or for what purpose. This saves money in design, and in the long term, increases benefits of sharing data easily."

David Burbridge
Senior Engineer, Technical Services, Network Rail

In response, some rail stakeholders have adopted an assortment of different technologies with the goal of increasing operational efficiency, but their often proprietary nature can prove extremely problematic for cross-industry visibility and interoperability.

With as much as 70 percent of rail traffic in Sweden coming from other European countries, Trafikverket, the Swedish government agency responsible for transport, realises the importance of effectively tracking vehicles and sharing rail traffic data for safe and efficient operations.

> **By using EPCIS in their rail operations, Trafikverket is saving 30-60 minutes on each train that arrives at the harbour, eliminating extra manual work and improving production.**

"As we add more traffic and faster trains, it's imperative that we care for our existing infrastructure," says Karl Åkerlund, Rail Infrastructure Manager for Trafikverket. "We need to understand what vehicles are on our tracks, because if there's a bearing problem or a flat wheel, it affects our rail operations.

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Sharing information for interoperability starts with two applications as the foundation for the use of EPCIS in rail. These applications include tracking vehicles as they travel within and across different countries for improved asset management and associating vehicle data with the Wayside Train Monitoring System (WTMS) data for enhanced preventive maintenance.

"In any complex organisation or where action of multiple partners intertwine, anything that standardises and simplifies sharing of data holds significant value. EPCIS just makes sense in rail."

Philip Leslie
Business Development Manager, Coriel

GS1 identification standards used include the Global Individual Asset Identifier (GIAI), to uniquely identify individual rail vehicles, and the Global Location Number (GLN), to identify vehicle whereabouts. Each vehicle's GIAI is encoded on GS1 EPC/RFID tags, which are mounted on opposite corners of the vehicle.

This additionally allows for determination of its orientation, which, in turn, makes it possible to associate vehicle visibility event data with individual vehicle components, such as wheel sets. RFID-enabled Automatic Vehicle Identification (AVI) readers at various trackside points along the way identify each EPC/RFID tagged vehicle, simultaneously linking the vehicle's GIAI with its travel direction, axle count, speed and length.

Orientation data is also important to logistical operations to accommodate incoming vehicles with single-side loading and unloading. Besides vehicle-level information, RFID-enabled AVI systems also enable train-level information exchanges, such as a train entering or leaving a yard, and the composition of the train.

"Standards are being supported by an increasing number of train operators in Great Britain and across Europe, meaning the same tags can be used on either side of the Channel Tunnel, no matter what system is actually doing the reading, or for what purpose," says David Burbridge, Senior Engineer in Technical Services for the U.K.'s Network Rail.

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GS1 standards also enhance WTMS systems by enabling automatic collection of measurement results and linking them to specific rail vehicles for safety and preventive maintenance. Where once railway workers, using walkie-talkies and faxes, would need to search the entire train for a defect, the GIAI pinpoints the impacted vehicle accurately, eliminating manual labour and a process vulnerable to error.

The GS1 standard EPCIS enables rail operators, infrastructure companies and even cargo owners to share information about the physical location and movement of individual rail vehicles and entire trains as they travel from country to country. EPCIS is capable of supporting additional, rail-specific requirements as implementations grow, ensuring end-to-end visibility for all stakeholders.

"In any complex organisation, or where the actions of multiple partners intertwine, anything that standardises and simplifies sharing of data holds significant value," says Philip Leslie, Business Development Manager for Coriel, an RFID solution provider. "EPCIS just makes sense in rail."

Åkerlund agrees. "Once the EPCIS rail application standard is published, our objective will be to point out the many advantages to our industry, including a better return on investment by using more relevant information."

Learn how you can get on board with GS1 standards, including EPCIS.

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